

DEPARTMENT OF PUBLIC SERVICE REGULATION
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MONTANA

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|--------------------------------------|---------------------|
| IN THE MATTER of The Application of) | UTILITY DIVISION |
| MONTANA-DAKOTA UTILITIES COMPANY,) | |
| a Division of MDU Resources Group,) | DOCKET NO. 88.11.53 |
| Inc., for Authority to Establish) | |
| Increased Rates for Gas Service.) | ORDER NO. 5399b |

TECHNICAL

APPENDIX

C

Table C1
MDU's Functionalized and Classified Costs for Firm
Residential (Rate 60) and Commercial (Marginal Rate 70) Classes

| <u>Function/Sub-Function</u> | <u>Classified Costs</u> | | |
|------------------------------|-------------------------------|---|-----------------------------------|
| | <u>Energy</u> <u>\$/dk</u> | <u>Demand</u> <u>\$/Peak</u> <u>Day MCF</u> | <u>Customer</u> <u>\$/Year</u> |
| <u>Production:</u> | | | |
| Purchased Gas | \$2.415 | | |
| With Line Losses | 2.444 | | |
| <u>Demand:</u> | | | |
| Carrying Cost | | \$ 2.62 | |
| A&G | | .09 | |
| O&M | | 8.67 | |
| Working Capital | | .07 | |
| Total | | <u>\$11.45</u> | |
| <u>Customer:</u> | | | |
| Residential Rate 60: | | | |
| Carrying Cost | | | \$145.46 |
| Distribution O&M | | | 97.81 |
| Customer O&M | | | 41.64 |
| A&G | | | 33.66 |
| Working Capital | | | 3.63 |
| Total | | | <u>\$322.20</u> |
| Commercial Rate 70: | | | |
| Carrying Cost | | | \$342.40 |
| Distribution O&M | | | 230.22 |
| Customer O&M | | | 41.64 |
| A&G | | | 65.63 |
| Working Capital | | | 8.54 |
| Total | | | <u>\$688.43</u> |

Sources: Exh. No. MDU-J, Exhibits RAF-12, 15 and 17. Costs are from Mr. Feingold's supplementary testimony.

Table C2
Summary of MDU's Unit Marginal Costs, Billing
Determinants, and Class Revenue Requirements

| <u>Unit LRIC:</u> | <u>Residential Rate 60</u> | <u>Commercial Rate 70</u> | |
|------------------------------------|--------------------------------|-------------------------------|--------------|
| Energy (\$/dk) | \$ 2.444 | \$ 2.444 | |
| Demand (\$/Peak Day Mcf) | 11.45 | 11.45 | |
| Customer (\$/Yr.) | 322.20 | 688.44 | |
| <u>Billing Units:</u> | | | |
| dk sales | 5,891,351 | 3,595,213 | |
| Peak Day Mcf | 44,574 | 27,969 | |
| No. of Customers | 55,435 | 6,626 | |
| <u>LRIC Revenue Responsibility</u> | | | |
| Energy | 14,398,462 | 8,786,701 | |
| Demand | 510,372 | 320,188 | |
| Customer | <u>17,861,157</u> | <u>4,561,603</u> | |
| Total | \$32,769,991 | \$13,668,492 | \$46,438,483 |
| Final Proposed Revenue | | | 46,175,149 |
| Reconciliation Factor | | | .99432939 |
| Class Revenues | \$32,584,165 | \$13,590,983 | \$46,175,149 |

Source: Billing, sales and customer data: Exh. No. I (RAF-10).
LRICs: Exh. No. J (RAF-11).

Table C3
MDU's Unit Cost For Interruptible Sales
and Interruptible and Firm Transportation Service

| <u>Classified Costs</u> | <u>Interruptible Sales (Rates 71 & 85)</u> | <u>Transport (Rates 81 & 82)</u> | <u>Firm Transport (Rate 84)</u> |
|---------------------------|--|--|---|
| <u>Commodity</u> | | | |
| <u>Demand:</u> | | | |
| Distribution Demand | <u>0.376</u> | <u>0.376</u> | <u>1.048</u> |
| Total Demand (\$/MCF) | <u>\$0.376</u> | <u>\$0.376</u> | <u>\$1.048</u> |
| <u>Energy:</u> | | | |
| Gas Cost (with line loss) | 2.933 | 0 | 0.000 |
| Other | <u>0.101</u> | <u>0.101</u> | <u>0.101</u> |
| Total Energy (\$/dk) | <u>3.034</u> | <u>0.101</u> | <u>0.101</u> |
| Total Commodity (\$/dk) | <u>\$3.410</u> | <u>0.477</u> | <u>1.149</u> |
| Line Losses at 1.19% | | <u>\$0.041</u> | <u>0.041</u> |
| Totals | <u>\$3.410</u> | <u>N/A</u> | <u>\$1.190</u> |

Source: Exh. No. MDU-C, DRB-4, p. 1. It should be noted that MDU added costs per Mcf and costs per dk in computing its total Commodity costs.

Table C4
MCC's Functionalized and Classified Costs

| <u>Function</u> | <u>Classified Costs</u> | |
|---------------------------------|-------------------------|---------------|
| <u>Gas Supply</u> | <u>Energy</u> | <u>Demand</u> |
| <u>Purchased Gas 1/</u> | | |
| Firm (\$/dk) | \$2.454 | |
| With 1.19% Losses | 2.484 | |
| Interruptible (\$/dk) | 2.213 | |
| With 1.19% Losses | 2.240 | |
| Distribution Demand (\$/MCF) 2/ | 6.605 | \$6.605 |
| <u>Customer 3/</u> | | |

Source: Exh. No. MCC-14, JD-7, pp. 2 & 4. All dollar figures expressed in 7/90 year's dollars.

- 1/ Firm purchased gas costs include certain WBIP energy and demand costs, although the demand costs were classified as energy; interruptible gas costs include only certain WBIP energy costs.
 - 2/ Distribution demand costs are classified as demand and energy (see MCC-13, p. 8) (see Exh. No. MCC-13, p. 8 and Exh. No. MCC-14, JD-8, p. 1).
 - 3/ Customer costs were not calculated on a unit cost basis.
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Table C6
MCC Billing Determinants

| Customer Class | Purch. Gas (dk) | Peak-Day Mcf | <u>Distribution</u> | | <u>Cust 1/</u> |
|---------------------|-----------------------|-----------------|-----------------------------|---------------------------|----------------|
| | | | Demand 2-day Peak MCF | Energy (dk at Dist) | |
| Residen | 5,891,351 | 44,574 | 86,383 | 5,711,697 | N/A |
| Firm Commer. | 3,596,343 | 27,964 | 54,194 | 3,467,439 | N/A |
| Interrup Commer. | 174,195 2/ | 0 | 0 | 174,195 2/ | N/A |
| Contract Indust. | 342,046 | 0 | | 233,012 | N/A |
| Transport | 0 | 0 | | 362,647 | N/A |

Source: Exhs. MCC-13, JD-9, MCC-14, JD-8, DR No. PSC-309 (a).

1/ Since MCC performs an embedded customer cost study (Exh. MCC-13, JD-9), direct allocation factors for converting units costs to annual revenues are not available (N/A).

2/ Adjusted downward from Exh. MCC-13, JD-9 factor 4 and JD-7, p. 5 (see MCC Answer Brief, pp. 8-9).

Table C10
Commission Adopted Total Marginal Cost
and Revenue Requirement Reconciliation

| <u>Class</u> | <u>Rate Class</u> | <u>Total Marginal Cost Revenues</u> | <u>Reconciliation Factor</u> | <u>Reconciled Marginal Cost Revenue Requirements</u> 1/ |
|------------------------|-------------------|-------------------------------------|------------------------------|---|
| Resident | 60 | \$25,879,099 | 1.1005087866 | \$28,480,175 |
| Commercial Firm | 70 | 15,577,918 | 1.1005087866 | 17,143,636 |
| Commercial Interrupt | 71 | 540,451 | 1.1005087866 | 594,771 |
| Industrial Interrupt | 85 | 982,287 | 1.1005087866 | 1,081,016 |
| Commercial Transport | 81 | 426 | 1.1005087866 | 469 |
| Industrial Transport | 82 | 36,387 | 1.1005087866 | 40,044 |
| Standby Firm | 83 | | | |
| Commercial Firm Transp | 84 | | | |
| Alternate Fuels | 90 | | | |
| Rate | 93 | | | |
| <u>Seasonal:</u> | | | | |
| Resident | 62 | | | |
| Comm Firm | 72 | | | |
| Total | | \$43,016,568 | 1.1005087866 | \$47,340,111 |

Sources:

1/ Excludes revenues from sources other than listed Rate classes and Rate 93.

Table C5
MCC's Reconciled Marginal Cost
Class Revenue Requirements 1/
(All Figures in \$)

| C esponsibility | Rate Classes | | | | |
|---------------------------|---------------------|---------------------|------------------|--------------------|------------------|
| | Firm | | | Interruptible | |
| | <u>Rate 60</u> | <u>Rate 70</u> | <u>Rate 71</u> | <u>Rate 85</u> | <u>Transport</u> |
| d Gas | | | | | |
| 2/ | \$14,634,116 | \$ 8,933,316 | \$445,120 | \$ 766,183 | --- |
| tion 3/ | | | | | |
| 4/ | 275,058 | 166,981 | 8,383 | 11,221 | 17,464 |
| 4/ | <u>294,410</u> | <u>184,704</u> | <u>---</u> | <u>---</u> | <u>---</u> |
| otal | 15,203,584 | 9,285,001 | 453,509 | 777,404 | 17,464 |
| Reconciled Revenues 5/ | 23,924,512 | 14,610,970 | 713,646 | 1,223,331 | 27,482 |
| stomer Costs 6/ | <u>4,824,668</u> | <u>1,887,468</u> | <u>9,533</u> | <u>22,603</u> | <u>22,585</u> |
| Class Revenue rements | <u>\$28,749,180</u> | <u>\$16,498,438</u> | <u>\$723,179</u> | <u>\$1,245,934</u> | <u>\$50,067</u> |

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costs are stated in aggregate terms and allocated per Exh. Nos. MCC-14, JD-8, p. 1, MCC-13, . Distribution energy cost reflect 5,000 dk reclassified Rate 71 volumes (see MCC Answer f, pp. 8-9).

No. MCC-14, JD-7, p. 5.

tribution costs are classified as 50% demand and 50% energy per Exh. No. MCC-13, p. 8, MCC-14.

No. MCC-14, JD-7, p. 1, and JD-8, p. 1.

totals were multiplied by a 1.57361 adjustment factor. Exh. No. MCC-8.

did not reconcile customer costs (see Exh. No. MCC-14, JD-8, p. 1).

Table C7
Commission's Unit Marginal Costs^{1/}

| | Energy | | | Demand Costs (\$/Peak Day MCF) | | Customer 5/ Cost (\$/Yr) | |
|---|---------------------------------|------------------------------------|---------------------------------|-----------------------------------|------------------------------|------------------------------|-----------|
| | WBIP 4/ Gas Costs (\$/dk) | WBIP 4/ AEQ Cost (\$/Mcf/Yr) | Line Loss Cost (at 1.09%) | Total Cost (\$/dk) | Distribution 3/90 Dollars | WBIP MDQ Cost 6/ Small | Large |
| / | \$2.761 | \$.335 | \$.034 | \$3.130 | \$13.04 | \$42.46 | \$ 89.57 |
| / | \$2.761 | \$.335 | \$.034 | \$3.130 | \$13.04 | \$42.46 | \$ 415.55 |
| / | \$2.761 | \$.335 | \$.034 | \$3.130 | \$13.04 | \$42.46 | |

ible

| | | | | | | | | |
|---|---------|-----|---------|---------|---------|---------|------------|-------------|
| / | \$2.761 | N/A | \$.030 | \$2.791 | \$13.04 | \$42.46 | \$1,813.05 | \$14,385.37 |
| / | \$2.761 | N/A | \$.030 | \$2.791 | \$13.04 | \$42.46 | \$2,284.92 | \$13,927.15 |
| / | \$2.761 | N/A | \$.030 | \$2.791 | | | | |

port

| | | | | | | | | |
|--|-----|-----|---------|---------|---------|----|--|--|
| | N/A | N/A | \$.030 | \$.030 | \$13.04 | 3/ | | |
|--|-----|-----|---------|---------|---------|----|--|--|

ible

| | | | | | | | | |
|---|-----|-----|---------|---------|--|--|--|--|
| / | N/A | N/A | \$.030 | \$.030 | | | | |
| / | N/A | N/A | \$.030 | \$.030 | | | | |

See MDU DR MCC 5-9, Attachment.
rent year's dollars unless otherwise stated.
ales for Rates 71, 85, 81, and 82 are included in Rate 70.
riate when firm volumes arise.
d Non-Gas Costs and AEQ costs per WBIP's Twentieth Revised Sheet No. 10.
and large meter based customer costs are only applicable to Rates 71 and 85.
IP's Twentieth Revised Sheet No. 10. First Revised Volume No. 1.

Table C8
Commission Adopted Billing Determinants

| <u>ss</u> | <u>Rate Class</u> | <u>Peak-Day Volumes Mcf (14.73 Psia) At Distrib 1/</u> | <u>Annual Energy Sales dk 2/</u> | <u>Customers/Month 3/</u> | | |
|------------|-------------------|--|----------------------------------|---------------------------|---------------------|---------------------|
| | | | | <u>Small Meters</u> | <u>Large Meters</u> | <u>Total Meters</u> |
| | 60 | 44,574 | 5,891,351 | 55,424 | 11 | 55,435 |
| 1 Firm 4/ | 70 | 27,964 | 3,596,343 4/ | 1,640 | 4,986 | 6,626 |
| 1 Interrup | 71 | 77 | 174,195 | 22 | 1 | 23 |
| 1 Interrup | 85 | 210 | 342,046 | 6 | 1 | 7 |
| 1 Transp | 81 | 0 | 14,202 | 0 | 0 | 0 |
| 1 Transp | 82 | 0 | 1,212,905 | 0 | 0 | 0 |
| irm | 83 | 0 | 0 | 0 | 0 | 0 |
| rm Transp | 84 | 0 | 0 | 0 | 0 | 0 |
| Fuels | 90 | 0 | 0 | 0 | 0 | 0 |
| | 93 5/ | -- | -- | -- | -- | -- |
| | 62 | | | | | |
| 1 Firm | 72 | | | | | |

ce: Exh. No. MCC 2-20, Att. A, p. 1 and Exh. No. MCC 7-8.
Al Clark's Exhibits (AEC-4, Amended) which has 71,830 dk rolled into interruptible rates. Volumes Rates 60, 70, 71 and 85 are not adjusted for 1.09% losses. Volumes for Rate 82 include 861,117 dk Rate 97.

ce: MDU response to DR PSC-61 (a), Exh. MCC 1-35. Customer numbers for Rates 71, 81, 82 and 85 ed under small and large meters per Exh. MCC 7-8, Att. A., and Late Filed Exh. 3, Att. A pp. 1-3. tomer numbers listed for Rates 71 and 85 listed under "small" and "large" meters refer to positive placement and orifice type meters, respectively.

udes firm Rates 71, 81, 82 and 85 volumes totaling 71,830 dk.

93 volumes are included in Rate 70.

Table C9
Commission's Total Marginal Cost Based Revenues 1/

| s | Rate | Demand (\$/Peak Day Mcf) Distribution 7/90 Dollars | WBIP MDQ Cost | Energy Total Cost (\$/dk) | Customer (\$/Yr) (3/90 Dollars) | | |
|---------|------|---|------------------|---------------------------------|------------------------------------|-----------------|-----------------|
| | | | | | Small Meters | Large Meters | Total Meters |
| | 60 | \$581,245 | \$1,892,612 | \$18,439,929 | \$ 0 | \$ 0 | \$4,965,313 |
| l Firm | 70 | 368,393 | 1,199,537 | 11,256,554 | 0 | 0 | 2,753,434 |
| l | 71 | 0 | 0 | 486,178 | 39,887 | 14,385 | 0 |
| l | 85 | 0 | 0 | 954,650 | 13,710 | 13,927 | 0 |
| l | 81 | 0 | 0 | 426 | 0 | 0 | 0 |
| l | 82 | 0 | 0 | 36,387 | 0 | 0 | 0 |
| irm | 83 | 0 | 0 | 0 | 0 | 0 | 0 |
| l sport | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fuels | 90 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 93 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 62 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 72 | 0 | 0 | 0 | 0 | 0 | 0 |

rent year's dollars unless otherwise stated.

Table C11
MDU's Pre-Interim and Interim Revenues and Commission's Adjusted
Pre-Final Revenues and Moderated Class Revenue Requirements (\$000)

| | <u>Rate</u> 60 | Pre-Interim Revenues 1/ \$27,585 | Interim Revenues 2/ \$27,830 | Adjusted Pre-Final Revenues 3/ \$27,592 | Commission's Total Marginal Costs \$25,879 | Equal Percent Reconciled Total Marginal Costs \$28,480 | Commission's Moderated Class Revenue Requirements \$27,904 |
|------------|-------------------|--|------------------------------------|--|--|--|--|
| 1 Firm | 70 | 16,639 | 16,786 | 16,971 | 15,578 | 17,144 | 17,163 |
| 1 | 71 | 1,084 | 1,094 | 740 | 540 | 595 | 740 |
| 1 | 85 | 1,022 | 1,032 | 1,261 | 982 | 1,081 | 1,261 |
| 1 | 81 | 5.8 | 5.8 | 12 | 0.426 | 0.469 | 28 |
| 1 | 82 | 422 | 422 | 349 | 36 | 40 | 234 |
| irm | 83 | 0 | 0 | 0 | | | 0 |
| 1 sport | 84 | 0 | 0 | 0 | | | 0 |
| Fuels | 90 | 0 | 0 | 0 | | | 0 |
| | 93 | 0.049 | 0.049 | 0.049 | | 0.049 | 0.049 |
| venues 4/ | | <u>96</u> \$46,854 | <u>96</u> \$47,266 | <u>185</u> \$47,101 | <u></u> \$40,017 | <u>185</u> \$47,517 | <u>185</u> \$47,517 |

Statement H, p. 8, and MDU's interim work papers. Rate 97 revenues were added to Rate 82 for interim and interim revenues.

workpapers sent regarding the Commission's approval of an equi-percent revenue increase (received 2/13/89). Revenues for Rates 81 and 82 were held constant in the interim.

Nos. MDU-F, TAA-1, MCC 1-35. Revenues represent prices tariffed prior to Interim Order No. , in addition to other revenues resulting in the docket. Volumes and number of customers are e accepted in this Order.

icant's Statement H, p. 1 and FOF Nos. 47, 52, 57 and 60.

Table C12
The Parties' Proposed Revenues and Percent Changes In Class Revenues Requirements

| <u>Class</u> | <u>Rate</u> | <u>Pre-Interim Revenues 1/ \$27,585,139</u> | <u>MDU's Proposed Revenues 2/ \$29,578,831 (7.23%)</u> | <u>MCC's Proposed Revenues 3/ \$27,833,921 (.90%)</u> | <u>MCC's Proposed Revenues 4/ \$27,831,758 (.89%)</u> |
|--------------|-------------|---|--|---|---|
| 1 Firm | 70 | 16,638,550 | 16,598,849 5/ | 16,786,483 (.89%) | 17,120,458 (2.90%) |
| 1 Interrupt | 71 | 1,084,466 | | 1,094,108 (.89%) | 1,094,108 (.89%) |
| 1 Interrupt | 85 | 1,022,455 | | 1,031,545 (.89%) | 1,031,545 (.89%) |
| 1 Transport | 81 | | | | |
| 1 Transport | 82 | | | | |
| 1 Firm | 83 | | | | |
| 1 Transport | 84 | | | | |
| Fuels | 90 | | | | |

Statement H, p. 8, and MDU's interim work papers. Rate 97 revenues were added to Rate 82 to calculate current revenues.

No. MDU-F, TAA-1, p. 1.

No. MCC-14, pp. 12-13.

No. MCC-13, JD-10 and 11, two different revenue proposals are shown due to an apparent inconsistency in MCC's testimony.

2.18% revenue decrease for Rate 70 reflects a decrease below revenues MDU reestimated by adding what appears to be the 71,830 dk of firm loads for interruptible customers (see Exh. MDU-F, TAA-1, p. 1). This comparison assumes \$16,969,532 of revenue for the firm commercial class, yielding a -2.18% change in final firm commercial revenues.